

### **Amendments to the Claims**

This listing of Claims will replace all prior versions, and listings, of Claims in the application.

#### **Listing of Claims:**

1-22. (Canceled)

23. (Currently Amended) A computer-readable medium having computer-executable instructions ~~module~~ for calculating the luminance value from an input image data, said input image data comprising a red (R) digital data value, a green (G) digital data value and a blue (B) digital data value, said luminance value calculation ~~module~~ comprising:

~~a red left shift by one module, said red left shift by one module~~ shifting said R digital data value to the left by one digital place value, producing a R intermediate digital data value;

~~a green left shift by two module, said green left shift by two module~~ shifting said G digital data value to the left by two digital place values, producing a G intermediate digital data value;

~~a first adder,~~ adding said R intermediate digital data value to said B digital value, producing a first intermediate value;

~~a second adder,~~ adding G digital value to said G intermediate digital data value, producing a second intermediate value;

~~a third adder,~~ adding said first intermediate value to said second intermediate value, producing a third intermediate value; and

~~a right shift by three module, said right shift by three module~~ shifting said third intermediate value by three digital place values, producing said luminance value.

24. (Currently Amended) The computer-readable medium ~~module for~~ calculating said luminance value of Claim 23 wherein said luminance value calculation

~~further comprises performing module~~ substantially performs the calculation  $Y = (2 \cdot R + 5 \cdot G + B) / 8$ , where Y is substantially the luminance value for said input image data.

25. (Currently Amended) A computer-readable medium having computer-executable instructions ~~module~~ for calculating the hue angle of an input image data, said input image data comprising a red (R) digital data value, a green (G) digital data value and a blue (B) digital data value, said hue angle calculation ~~module~~ comprising:

- ~~a module for~~ calculating a luminance value from said input image data, producing a Y digital value;
- ~~a module for~~ calculating intermediate values  $x = \text{absolute values of } B - Y$  and  $y = \text{absolute value of } R - Y$ ;
- ~~a module for~~ swapping intermediate values x and y if  $y > x$ ;
- dividing y by x ~~a y divided by x module~~;
- accessing an action look-up table to provide correction bits for performing calculations within the first subset of hue angle space; and
- accessing an arctangent look-up table, said arctangent table producing an intermediate hue angle value.

26. (Currently Amended) The computer-readable medium ~~module for~~ calculating the hue angle of Claim 25 wherein said ~~module for~~ calculating of a luminance value comprises performing ~~performs~~ the calculation  $Y = (2 \cdot R + 5 \cdot G + B) / 8$ , where Y is substantially the luminance value for said input image data.

27. (Currently Amended) The computer-readable medium ~~module for~~ calculating the hue angle of Claim 25 wherein said ~~module for~~ calculating of a luminance value comprises:

- ~~a red left shift by one module, said red left shift by one module~~ shifting said R digital data value to the left by one digital place value, producing a R intermediate digital data value;

~~a green left shift by two module, said green left shift by two module~~ shifting said G digital data value to the left by two digital place values, producing a G intermediate digital data value;

~~a first adder,~~ adding said R intermediate digital data value to said B digital value, producing a first intermediate value;

~~a second adder,~~ adding G digital value to said G intermediate digital data value, producing a second intermediate value;

~~a third adder,~~ adding said first intermediate value to said second intermediate value, producing a third intermediate value; and

~~a right shift by three module, said right shift by three module~~ shifting said third intermediate value by three digital place values, producing said luminance value.

28. (Currently Amended) The computer-readable medium ~~module for~~ calculating the hue angle of Claim 25 wherein said action look-up table provides corrections with the first octant of said hue angle space.

29. (Currently Amended) A computer-readable medium having computer-executable instructions ~~module~~ for converting an RGB input image data into an RGBW image data, said conversion ~~module~~ comprising:

~~a module for~~ calculating the hue angle of said RGB input image data;

~~a module for~~ selecting the chromaticity triangle of said RGB input image data based upon said hue angle, said chromaticity triangles being selected from one of a group, said group comprising RGW, GBW and BRW;

~~a module for~~ selecting a multi-primary matrix based upon said chromaticity triangle;

~~a module for~~ multiplying said multi-primary matrix to said RGB input image data to produce an intermediate RGBW image data value; and

wherein further said multi-primary matrix being selected from one of a group, said group comprising:

168 0 -40

128 0 0

168 -40 0

$$\begin{matrix} 0 & 168 & -40 & & -40 & 168 & 0 & & 0 & 128 & 0 \\ 0 & 0 & 128 & ; & -40 & 0 & 168 & ; & \text{and} & 0 & -40 & 168. \end{matrix}$$

30. (Currently Amended) The computer-readable medium module for ~~converting RGB input image data into an RGBW image data~~ of Claim 29 wherein said group of said multi-primary matrices correspond to RGW, GBW, and BRW chromaticity triangles respectively.

31. (Currently Amended) The computer-readable medium module for ~~converting RGB input image data into an RGBW image data~~ of Claim 29 wherein the conversion further comprises comprising:

~~a module for detecting out-of-gamut image data values;~~  
~~a module for determining the maximum color component that is out-of-gamut;~~  
and  
accessing an inverse look-up table for providing a scaling factor to apply to said out-of-gamut image values.

32. (Currently Amended) The computer-readable medium module for ~~converting RGB input image data into an RGBW image data~~ of Claim 29, wherein the conversion further comprises comprising:

~~a module for subpixel rendering said RGBW image data values; and~~  
accessing an output gamma look-up table for providing gamma values to be applied to image data values from said subpixel rendering module.